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EXAMINER

ANDREWS, LEON T

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/500,014	Applicant(s) FUNABIKI ET AL.	
	Examiner LEON ANDREWS	Art Unit 2462	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. **Claims 1-30** are being rejected under 35 U.S.C. 103 (a) by Gwon (Pub. No.: US 2003/0016655 A1) in view of Warriar et al. (Patent No.: US 6,707,809 B1) and Leung (Patent No.: US 6,195,705 B1).

Regarding Claim 1, Gwon discloses a mobile node (Fig. 1, mobile node 135) comprising:

a measuring section (Mobile IP version 6 route optimization, paragraph [0055], page 6, lines 2-3) for measuring at least one of a hop number (network topology requires at most five hops during packet routing, paragraph [0055], page 6, lines 4-5) and communication delay time (codec, packet formation, propagation and unknown access delays due to high variable wireless link conditions, paragraph [0055], page 6, lines 6-9) to a home agent (Fig. 1, Home Agent (HA) 145), wherein the home agent registers a care-of address that the mobile node is utilizing for communication (new “care of” IP address is registered with the home area (HA) by the mobile node 135, paragraph [0050], page 5, lines 10-12), and the home agent forwards messages directed to a home address of the mobile node to the care-of address (packets (messages) transmitted to the home IP address of the mobile node 135 will be tunneled by the home area (HA) to the mobile node 135 at its new “care-of” IP address, paragraph [0050], page 6, lines 20-23);

a home agent information acquiring section (Fig. 1, gateway router (GR) 130, maintains current location information for the mobile node, paragraph [0039], page 4, lines 3-5) for

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acquiring information about a home agent (Fig. 1, 145) as a subject of measurement (route packets to the mobile node, paragraph [0039], page 4, lines 5-6) of the measuring section; and a home agent selecting section (Fig. 5, L3MP mobility prediction, 710) for changing, when a measurement value (value selected to indicate when a hand-off is prior to the actual hand-off, paragraph [0060], page 7, lines 2-7; value as to when the actual hand-off based on prediction 710, paragraph [0084], page 9, lines 16-18) to the home agent to which the mobile node belongs (mobile node 135 within home agent HA establishes a value that leaves time to enable the mobile node 135 to complete the hand-off to the new agent when the actual hand-off is based on prediction 710, paragraph [0084], page 9, lines 12-18) becomes equal to or greater than a first predetermined value (threshold value, paragraph [0060], page 7, line 2; value established by the mobile node 135 must receive the pre-establishment completion, paragraph [0084], page 9, lines 10-12) belonging home agent to a new home agent (mobile node 135 within home agent HA establishes a value that leaves time to enable the mobile node 135 to complete the hand-off to the new agent when the actual hand-off is based on prediction 710, paragraph [0084], page 9, lines 12-18), the belonging home agent and the new home agent being associated to a same home network of the mobile node, by using the information which acquired in the acquiring section, having a measurement value (time-out value set to enable the mobile node to complete the hand-off process to the new local agent before communications with the old agent are lost, paragraph [0084], page 9, lines 12-15) equal to or less than a second predetermined value (time-out value can be set based on information provided by the mobility prediction process 710, paragraph [0084], page 9, lines 16-17), wherein the new home agent after the change forwards messages directed to the home address of the mobile node to the care-address (packets (messages) transmitted to the home IP address of the mobile node 135 will be tunneled

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by the home area (HA) to the mobile node 135 at its new “care-of” IP address, paragraph [0050], page 6, lines 20-23).

Gwon fails to disclose the selecting from the belonging home agent to a new home agent.

But, Warriar et al. discloses in Fig. 2, home agent control mode performs home agent functions with plurality of home agents 18, 18A and 18B whereby home agent 18 (new home agent) performs tunneling for the mobile node and forwards packets of data from the WAP server of home agent, home radius 38 assigned to home network 14 to the foreign agent 16 for transmission to the mobile node 10, columns 5 and 6, lines 58-67 and lines 1-3 respectively.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Warriar et al.’s selecting from the belonging home agent to a new home agent because this would have allowed the home agent 18 (new home agent) to forward packets of data to the mobile node 10, columns 5 and 6, lines 66-67 and lines 1-3 respectively.

The combination of Gwon and Warriar et al. fails to disclose the belonging home agent and the new home agent being associated to a same home network of the mobile node.

But, Leung discloses in Fig. 2A, the belonging home agent (HA1) and the new home agent (HA2, HA3) being associated to a same home network (home network 12) of the mobile node (Mobile Nodes 6, 27).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Leung’s belonging home agent and the new home agent being associated to a same home network of the mobile node because this would have allowed the

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original active Home Agent to relinquish its active status and revert to the new Home Agent, column 17, lines 58-60.

Regarding Claim 2, Gwon discloses a mobile node according to claim 1, wherein, in a case that the mobile node is in real-time communication with another node, the measuring section measures a communication delay time to the home agent to change (packet latency is reduced by pre-establishing a new route before hand-off occurs to provide fast, real-time, dynamic route establishment between a mobile node and another fixed or mobile correspondent node when hand-off occurs, paragraph [0027], page 3, lines 1-6) , when a communication delay to the belonging home agent becomes equal to or greater than a third predetermined value (predictive analyses used to get an advanced determination when the network communications with the mobile node will be handed off from one neighboring node to another, paragraph [0027], page 3, lines 6-10), the belonging home agent by one having a communication delay equal to or smaller than a fourth predetermined value (delays due to pre-established and new routes are greatly reduced, paragraph [0027], page 3, lines 12-17);

and in the case of not so, the measuring section measures a hop number (Fig. 4, 720) to the home agent to change, when a hop number (Fig. 4, 720) to the belonging home agent becomes equal to or greater than a first predetermined value (threshold value, paragraph [0060], page 7, line 2), the belonging home agent by one having a hop number (Fig. 4, 720) equal to or smaller than a second predetermined value (time-out value can be set based on information provided by the mobility prediction process 710, paragraph [0084], page 9, lines 16-17).

Regarding Claim 3, Gwon discloses a mobile node according to claim 1, wherein the measuring

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section determines the hop number by computing a difference ((IP version 6 requires at most five hops during packet routing, paragraph [0055], page 6, lines 2-5) - (Fig. 4, hops from mobile node 135 to correspondent node FA is 2 (2 times 720)) between an initial value of a hop limit field in a header of a packet of IP version 6 (IP version 6 requires at most five hops during packet routing, paragraph [0055], page 6, lines 2-5) sent from the home agent and a value of the hop limit field (Fig. 4, hops from mobile node 135 to correspondent node FA is 2 (2 times 720) received.

Regarding Claim 4, Gwon discloses a mobile node according to claim 2, wherein the measuring section determines the hop number by computing a difference between an initial value of a hop limit field in a header of a packet of IP version 6 sent from the home agent and a value of the hop limit field received ((IP version 6 requires at most five hops during packet routing, paragraph [0055], page 6, lines 2-5) - (Fig. 4, hops from mobile node 135 to correspondent node FA is 2 (2 times 720))).

Regarding Claim 5, Gwon discloses a mobile node according to claim 1, wherein the measuring section determines the communication delay time by measuring a time of from sending the home agent an ICMP echo request packet to receiving an ICMP echo reply packet from the home agent (mobile node 135 sends an ICMP a discovery request to the home router to determine any changes before beginning the pre-registration process, paragraph [0078], page 8, lines 5-10).

Regarding Claim 6, Gwon discloses a mobile node according to claim 2, wherein the measuring section determines the communication delay time by measuring a time of from sending the home

agent an ICMP echo request packet to receiving an ICMP echo reply packet from the home agent (mobile node 135 sends an ICMP a discovery request to the home router to determine any changes before beginning the pre-registration process, paragraph [0078], page 8, lines 5-10).

Regarding Claim 7, Gwon discloses a mobile node according to claim 1, wherein the measuring section increases a measuring frequency of communication delay time when the moving speed of the mobile node is high, and decreases the measuring frequency when the moving speed is low (velocity and direction of movement of the various mobile nodes predict the duration of time neighboring nodes can remain in communication, paragraph [0021], page 3, lines 5-7).

Regarding Claim 8, Gwon discloses a mobile node according to claim 3, wherein the measuring section sends an ICMP echo request packet when the number of times of connection changes to the access router (mobile node 135 sends ICMP HA request to its home router to determine if the home router IP address configuration has changed before beginning the pre-registration process 720 as specified in the mobile IP version 6 document, paragraph [0078], page 8, lines 5-10) becomes an integer (cast address, paragraph [0078], page 8, line 7) times a fifth predetermined value (pre-registration 720, paragraph [0078], page 8, lines 9-10).

Regarding Claim 9, Gwon discloses a home agent (Fig. 1, Home Agent (HA) 145) comprising: a home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) for answering a registration refusal (home agent does not grant the registration request, paragraph [0077], page 8, lines 10-11) to a mobile node (Fig. 1, mobile node 135) and notifying

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the mobile node of a changed-to home agent in a case that, when receiving a registration request (home agent/foreign agent 145 communicates the registration request, paragraph [0077], page 8, lines 3-4) from the mobile node (Fig. 1, mobile node 135), the home agent is deficient in unoccupied resource (deficiencies of the current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4), the home agent and the changed-to home agent being associated to a same home network of the mobile node, wherein the change-to home agent registers a care-of address that the mobile node is utilizing for communication (new “care of” IP address is registered with the home area (HA) by the mobile node 135, paragraph [0050], page 5, lines 10-12), and after the change the changed-to home agent forwards messages directed to a home address of the mobile node to the care-of address (packets (messages) transmitted to the home IP address of the mobile node 135 will be tunneled by the home area (HA) to the mobile node 135 at its new “care-of” IP address, paragraph [0050], page 6, lines 20-23).

Gwon fails to disclose a change-to home agent.

But, Warriar et al. discloses in Fig. 2, home agent control mode performs home agent functions with plurality of home agents 18, 18A and 18B whereby home agent 18 (change-to home agent) performs tunneling for the mobile node and forwards packets of data from the WAP server of home agent, home radius 38 assigned to home network 14 to the foreign agent 16 for transmission to the mobile node 10, columns 5 and 6, lines 58-67 and lines 1-3 respectively.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Warriar et al.’s a change-to home agent because this would have allowed the home agent 18 (change-to home agent) to forward packets of data to the

mobile node 10, columns 5 and 6, lines 66-67 and lines 1-3 respectively

The combination of Gwon and Warriier et al. fails to disclose the home agent and the changed-to home agent being associated to a same home network of the mobile node.

But, Leung discloses in Fig. 2A, the home agent (HA1) and the changed-to home agent (HA2, HA3) being associated to a same home network (home network 12) of the mobile node (Mobile Nodes 6, 27).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Leung's home agent and the changed-to home agent being associated to a same home network of the mobile node because this would have allowed the original active Home Agent to relinquish its active status and revert to the new Home Agent, column 17, lines 58-60.

Regarding Claim 10, Gwon discloses a home agent according to claim 9, further comprising:

a home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) for storing home agent information including an address and current resource information of another home agent (home agents/local agents 145 store IP addresses of intermediary nodes used for further communications between the mobile node 135 and the corresponding node 140, paragraph [0080], page 9, lines 19-25),

wherein the home agent information notifying section answers the registration refusal and selects a home agent (Fig. 1, Home Agent (HA) 145) suited for a predetermined condition (IP address of direct route resulting from the exchange of greeting packets in its route history cache,

paragraph [0080], page 9, lines 20-23) from the home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) to thereby answer home agent information of the selected home agent (Fig. 1, Home Agent (HA) 145, paragraph [0038], page 4, line 9).

Regarding Claim 11, Gwon discloses a home agent according to claim 10, wherein the predetermined condition is at least any of a maximum in unoccupied resource (current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4) and a minimum in load (data communication when the destination node is experiencing loads due to other factors, paragraph [0009], page 1, lines 14-17).

Regarding Claim 12, Gwon discloses a home agent (Fig. 1, Home Agent (HA) 145) comprising: a home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) for answering a registration refusal (home agent does not grant the registration request, paragraph [0077], page 8, lines 10-11) to a mobile node (Fig. 1, mobile node 135) and notifying the mobile node of a changed-to home agent (home area (HA) having registered the new “care of” IP address sends the mobile node 135 a binding update message establishing its new location (changed to home agent) in the network, paragraph [0050], page 5, lines 11-20) in a case that, when received a registration request (home agent/foreign agent 145 communicates the registration request, paragraph [0077], page 8, lines 3-4) from the mobile node (Fig. 1, mobile node 135), the mobile node entered a predetermined sub-network (Fig. 1, mobile node may

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change location such that it moves from one BTS sub-network 155 to another, paragraph [0042], page 4, lines 11-13), the home agent and the changed-to home agent being associated to a same home network of the mobile node, wherein the changed-to home agent registers a care-of address that the mobile node is utilizing for communication (new “care of” IP address is registered with the home area (HA) by the mobile node 135, paragraph [0050], page 5, lines 10-12), and after the change the changed-to home agent forwards messages directed to a home address of the mobile node to the care-of address (packets (messages) transmitted to the home IP address of the mobile node 135 will be tunneled by the home area (HA) to the mobile node 135 at its new “care-of” IP address, paragraph [0050], page 6, lines 20-23).

Gwon fails to disclose a change-to home agent.

But, Warriar et al. discloses in Fig. 2, home agent control mode performs home agent functions with plurality of home agents 18, 18A and 18B whereby home agent 18 (change-to home agent) performs tunneling for the mobile node and forwards packets of data from the WAP server of home agent, home radius 38 assigned to home network 14 to the foreign agent 16 for transmission to the mobile node 10, columns 5 and 6, lines 58-67 and lines 1-3 respectively.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Warriar et al.'s a change-to home agent because this would have allowed the home agent 18 (change-to home agent) to forward packets of data to the mobile node 10, columns 5 and 6, lines 66-67 and lines 1-3 respectively.

The combination of Gwon and Warriar et al. fails to disclose the home agent and the changed-to home agent being associated to a same home network of the mobile node.

But, Leung discloses in Fig. 2A, the home agent (HA1) and the changed-to home agent (HA2, HA3) being associated to a same home network (home network 12) of the mobile node (Mobile Nodes 6, 27).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Leung's home agent and the changed-to home agent being associated to a same home network of the mobile node because this would have allowed the original active Home Agent to relinquish its active status and revert to the new Home Agent, column 17, lines 58-60.

Regarding Claim 13, Gwon discloses a home agent according to claim 12, further comprising a home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) for storing home agent information including an address of another home agent (home agents/local agents 145 store IP addresses of intermediary nodes used for further communications between the mobile node 135 and the corresponding node 140, paragraph [0080], page 9, lines 19-25), wherein the home agent information notifying section answers the registration refusal and selects a home agent (Fig. 1,

Home Agent (HA) 145) having as a control range the sub-network (Fig. 1, 155) to thereby answer home agent information of the selected home agent.

Regarding Claim 14, Gwon discloses a home agent according to claim 11, wherein the registration refusal and the home agent information are an addition of a home agent information (home agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) option to a binding acknowledgement message (mobile node 135 is sent a binding acknowledgement message, paragraph [0050], page 5, lines 17-18).

Regarding Claim 15, Gwon discloses a home agent (Fig. 4, Home Agent (HA) 145) comprising: a home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) for notifying, when receiving a notification for changing a home agent (Fig. 4, Home Agent (HA) 145) and an address of a changed-to home agent (new care-of IP address to its home IP address, paragraph [0079], page 8, lines 4-5) from a belonging mobile node (Fig. 4, mobile node 135), the changed-to home agent of an entry content concerning the mobile node of a binding cache (Fig. 4, home agent 145 to update its binding cache to bind mobile node's new care-of IP address to its home IP address, paragraph [0079], page 8, lines 3-5), the home agent and the changed-to home agent being associated to a same home network of the mobile node, wherein the changed-to home agent registers a care-of address that the mobile node is utilizing for communication (new "care of" IP address is registered with the home area (HA) by the mobile node 135, paragraph [0050], page 5, lines 10-12), and after the change the changed-to home agent forwards messages directed to a home address of the mobile node to the care-of

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address (packets (messages) transmitted to the home IP address of the mobile node 135 will be tunneled by the home area (HA) to the mobile node 135 at its new “care-of” IP address, paragraph [0050], page 6, lines 20-23).

Gwon fails to disclose a change-to home agent.

But, Warriar et al. discloses in Fig. 2, home agent control mode performs home agent functions with plurality of home agents 18, 18A and 18B whereby home agent 18 (change-to home agent) performs tunneling for the mobile node and forwards packets of data from the WAP server of home agent, home radius 38 assigned to home network 14 to the foreign agent 16 for transmission to the mobile node 10, columns 5 and 6, lines 58-67 and lines 1-3 respectively.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Warriar et al.’s a change-to home agent because this would have allowed the home agent 18 (change-to home agent) to forward packets of data to the mobile node 10, columns 5 and 6, lines 66-67 and lines 1-3 respectively.

The combination of Gwon and Warriar et al. fails to disclose the home agent and the changed-to home agent being associated to a same home network of the mobile node.

But, Leung discloses in Fig. 2A, the home agent (HA1) and the changed-to home agent (HA2, HA3) being associated to a same home network (home network 12) of the mobile node (Mobile Nodes 6, 27).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Leung’s home agent and the changed-to home agent being associated to a same home network of the mobile node because this would have allowed the

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original active Home Agent to relinquish its active status and revert to the new Home Agent, column 17, lines 58-60.

Regarding Claim 16, Gwon discloses an access router (Fig. 2, routers, R1, R2) comprising:

a home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) for storing home agent information including an address of a home agent (home agents/local agents 145 store IP addresses of intermediary nodes used for further communications between the mobile node 135 and the corresponding node 140, paragraph [0080], page 9, lines 19-25); and

a home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) for notifying a mobile node (Fig. 4, mobile node 135), as a slave, of home agent information about another neighboring home agent (Fig. 4, Home Agent (HA) 145) stored in the home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21), the home agent and the neighboring home agent being associated to a same home network of the mobile node, wherein if the mobile node changes to the neighboring home agent, the neighboring home agent registers a care-of address that the mobile node is utilizing for communication (new “care of” IP address is registered with the home area (HA) by the mobile node 135, paragraph [0050], page 5, lines 10-12), and after the change the neighboring home agent forwards messages directed to a home address of the mobile node to the care-of address (packets (messages) transmitted to the home IP address of the mobile node 135 will be tunneled by the home area (HA) to the mobile node 135 at

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its new “care-of” IP address, paragraph [0050], page 6, lines 20-23).

Gwon fails to disclose changes to the neighboring home agent.

But, Warriar et al. discloses in Fig. 2, home agent control mode performs home agent functions with plurality of home agents 18, 18A and 18B whereby home agent 18 (neighboring home agent) performs tunneling for the mobile node and forwards packets of data from the WAP server of home agent, home radius 38 assigned to home network 14 to the foreign agent 16 for transmission to the mobile node 10, columns 5 and 6, lines 58-67 and lines 1-3 respectively.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Warriar et al.'s neighboring home agent because this would have allowed the home agent 18 (neighboring home agent) to forward packets of data to the mobile node 10, columns 5 and 6, lines 66-67 and lines 1-3 respectively

The combination of Gwon and Warriar et al. fails to disclose the home agent and the neighboring home agent being associated to a same home network of the mobile node.

But, Leung discloses in Fig. 2A, the home agent (HA1) and the neighboring home agent (HA2, HA3) being associated to a same home network (home network 12) of the mobile node (Mobile Nodes 6, 27).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Leung's home agent and the neighboring home agent being associated to a same home network of the mobile node because this would have allowed the original active Home Agent to relinquish its active status and revert to the new Home Agent, column 17, lines 58-60.

Regarding Claim 17, Gwon discloses an access router according to claim 16, wherein the home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) notifies the mobile node of home agent information (Fig. 4, home agent 145 information for the mobile node, paragraph [0079], page 8, lines 6-8) when requested from the mobile node (Fig. 4, mobile node 135).

Regarding Claim 18, Gwon discloses an access router according to claim 16, wherein the home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) periodically notifies the mobile node of home agent information (home agent 145 updates the mobile node's IP address to the home IP address, paragraph [0079], page 8, lines 3-5).

Regarding Claim 19, Gwon discloses a home agent information storing server (servers of various types, paragraph [0006], page 1, line 8) comprising:

- a home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) for holding home agent information including an address of a home agent (Fig. 4, Home Agent (HA) 145) which the home agent information storing server manages (Fig. 2, server);

- a home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) for notifying any one of a mobile node (Fig. 4, mobile node 135), access router (Fig. 2, routers, R1, R2) and home agent (Fig. 4, Home Agent (HA) 145) in connection to a network (Fig. 4, data network 100) of the home agent information (Fig. 4, home agent 145 information for the mobile node, paragraph [0079], page 8, lines 6-8) selected from the home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21),

- wherein when the home agent information storing server receives a notification for changing the home agent from the mobile node, the home agent information storing server

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notifies the home agent of a changed-to home agent, the home agent and the changed-to home agent being associated to a same home network of the mobile node, and

wherein the changed-to home agent registers a care-of address that the mobile node is utilizing for communication (new “care of” IP address is registered with the home area (HA) by the mobile node 135, paragraph [0050], page 5, lines 10-12), and after the change the changed-to home agent forwards messages directed to a home address of the mobile node to the care-of address (packets (messages) transmitted to the home IP address of the mobile node 135 will be tunneled by the home area (HA) to the mobile node 135 at its new “care-of” IP address, paragraph [0050], page 6, lines 20-23).

Gwon fails to disclose the server notifies the home agent of the change-to home agent.

But, Warriar et al. discloses in Fig. 2, home agent control mode performs home agent functions with plurality of home agents 18, 18A and 18B whereby home agent 18 (change-to home agent) performs tunneling for the mobile node and forwards packets of data from (notified by) the WAP server of home agent, home radius 38 assigned to home network 14 to the foreign agent 16 for transmission to the mobile node 10, columns 5 and 6, lines 58-67 and lines 1-3 respectively.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Warrier et al.'s server notifies the home agent of the change-to home agent because this would have allowed the home agent 18 (change-to home agent) to forward packets of data to the mobile node 10, columns 5 and 6, lines 66-67 and lines 1-3 respectively

The combination of Gwon and Warrier et al. fails to disclose the home agent and the changed-to home agent being associated to a same home network of the mobile node.

But, Leung discloses in Fig. 2A, the home agent (HA1) and the changed-to home agent (HA2, HA3) being associated to a same home network (home network 12) of the mobile node (Mobile Nodes 6, 27).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Leung's home agent and the changed-to home agent being associated to a same home network of the mobile node because this would have allowed the original active Home Agent to relinquish its active status and revert to the new Home Agent, column 17, lines 58-60.

Regarding Claim 20, Gwon discloses a home agent information storing server according to claim 19, wherein the home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) further holds any one piece of information of current unoccupied resource (current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4) and load (data communication loads,

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paragraph [0009], page 1, lines 14-17) of the managing home agent (Fig. 4, Home Agent (HA) 145).

Regarding Claim 21, Gwon discloses a home agent information storing server according to claim 20, further comprising a home agent information acquiring section (Fig. 1, gateway router (GR) 130, maintains current location information for the mobile node, paragraph [0039], page 4, lines 3-5) for receiving the information from the managing home agent (Fig. 4, Home Agent (HA) 145) and updating the home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21).

Regarding Claim 22, Gwon discloses a home agent according to claim 10, further comprising a home agent information acquiring section (Fig. 1, gateway router (GR) 130, maintains current location information for the mobile node, paragraph [0039], page 4, lines 3-5) for acquiring the home agent information (Fig. 4, home agent 145 information for the mobile node, paragraph [0079], page 8, lines 6-8) from the home agent information storing server (servers of various types, paragraph [0006], page 1, line 8) comprising:

a home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) for holding home agent information including an address of a managing home agent (Fig. 4, Home Agent (HA) 145); and

a home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) for notifying any one of a mobile node (Fig. 4, mobile node 135), access router

(Fig. 2, routers, R1, R2) and home agent (Fig. 4, Home Agent (HA) 145) in connection to a network (Fig. 4, data network 100) of the home agent information (Fig. 4, home agent 145 information for the mobile node, paragraph [0079], page 8, lines 6-8) selected from the home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21);

wherein the home agent information storing section further holds any one piece of information of current unoccupied resource (current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4) and load (data communication loads, paragraph [0009], page 1, lines 14-17) of the managing home agent (Fig. 4, Home Agent (HA) 145).

Regarding Claim 23, Gwon discloses a home agent according to claim 22, characterized to send information of own load (data communication loads, paragraph [0009], page 1, lines 14-17) and unoccupied resource (current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4) to the home agent information storing server (servers of various types, paragraph [0006], page 1, line 8):

a home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) for holding home agent information including an address of a managing home agent (Fig. 4, Home Agent (HA) 145); and

a home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079],

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page 8, lines 6-8) for notifying any one of a mobile node (Fig. 4, mobile node 135), access router (Fig. 2, routers, R1, R2) and home agent (Fig. 4, Home Agent (HA) 145) in connection to a network (Fig. 4, data network 100) of the home agent information (Fig. 4, home agent 145 information for the mobile node, paragraph [0079], page 8, lines 6-8) selected from the home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21);

wherein the home agent information storing section further holds any one piece of information of current unoccupied resource (current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4) and load (data communication loads, paragraph [0009], page 1, lines 14-17) of the managing home agent (Fig. 4, Home Agent (HA) 145).

Regarding Claim 24, Gwon discloses an access router (Fig. 2, routers, R1, R2) according to claim 16, further comprising a home agent information acquiring section (Fig. 1, gateway router (GR) 130, maintains current location information for the mobile node, paragraph [0039], page 4, lines 3-5) for getting the home agent information (Fig. 4, home agent 145 information for the mobile node, paragraph [0079], page 8, lines 6-8) from the home agent information storing server (servers of various types, paragraph [0006], page 1, line 8):

a home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) for holding home agent information including an address of a managing home agent (Fig. 4, Home Agent (HA) 145);
and

a home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) for notifying any one of a mobile node (Fig. 4, mobile node 135), access router (Fig. 2, routers, R1, R2) and home agent (Fig. 4, Home Agent (HA) 145) in connection to a network (Fig. 4, data network 100) of the home agent information (Fig. 4, home agent 145 information for the mobile node, paragraph [0079], page 8, lines 6-8) selected from the home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21);

wherein the home agent information storing section further holds any one piece of information of current unoccupied resource (current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4) and load (data communication loads, paragraph [0009], page 1, lines 14-17) of the managing home agent (Fig. 4, Home Agent (HA) 145).

Regarding Claim 25, Gwon discloses a mobile node (Fig. 1, mobile node 135) according to claim 1, wherein the home agent information acquiring section (Fig. 1, gateway router (GR) 130, maintains current location information for the mobile node, paragraph [0039], page 4, lines 3-5) gets the home agent information (Fig. 4, home agent 145 information for the mobile node, paragraph [0079], page 8, lines 6-8) from the home agent information storing server (servers of various types, paragraph [0006], page 1, line 8):

a home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) for holding home agent

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information including an address of a managing home agent (Fig. 4, Home Agent (HA) 145);
and

a home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) for notifying any one of a mobile node (Fig. 4, mobile node 135), access router (Fig. 2, routers, R1, R2) and home agent (Fig. 4, Home Agent (HA) 145) in connection to a network (Fig. 4, data network 100) of the home agent information (Fig. 4, home agent 145 information for the mobile node, paragraph [0079], page 8, lines 6-8) selected from the home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21);

wherein the home agent information storing section further holds any one piece of information of current unoccupied resource (current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4) and load (data communication loads, paragraph [0009], page 1, lines 14-17) of the managing home agent (Fig. 1, Home Agent (HA) 145, paragraph [0038], page 4, line 9).

Regarding Claim 26, Gwon discloses a mobile node (Fig. 1, mobile node 135) according to claim 1, wherein the home agent information acquiring section (Fig. 1, gateway router (GR) 130, maintains current location information for the mobile node, paragraph [0039], page 4, lines 3-5) gets information about a home agent (Fig. 1, mobile node 135) notified from the home agent comprising:

a home agent information notifying section (Fig. 4, home agent 145 notifies the correspondent node 140 to update its binding information for the mobile node, paragraph [0079], page 8, lines 6-8) for answering a registration refusal (home agent does not grant the registration request, paragraph [0077], page 8, lines 10-11) in a case that, when receiving a registration request (home agent/foreign agent 145 communicates the registration request, paragraph [0077], page 8, lines 3-4) from a mobile node (Fig. 1, mobile node 135), the home agent is deficient in unoccupied resource (deficiencies of the current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4); and

a home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) for storing home agent information including an address and current resource information of another home agent (home agents/local agents 145 store IP addresses of intermediary nodes used for further communications between the mobile node 135 and the corresponding node 140, paragraph [0080], page 9, lines 19-25),

wherein the home agent information notifying section answers the registration refusal and selects a home agent (Fig. 1, Home Agent (HA) 145, paragraph [0038], page 4, line 9) suited for a predetermined condition (IP address of direct route resulting from the exchange of greeting packets in its route history cache, paragraph [0080], page 9, lines 20-23) from the home agent information storing section (home agents/local agents 145 store IP addresses of intermediary nodes, paragraph [0080], page 9, lines 19-21) to thereby answer home agent information of the selected home agent (Fig. 1, Home Agent (HA) 145, paragraph [0038], page 4, line 9).

Regarding Claim 27, Gwon discloses a mobile node (Fig. 1, mobile node 135) according to claim 26, wherein the home agent selecting section selects (Fig. 5, L3MP mobility prediction, 710), preferentially, a home agent (Fig. 1, mobile node 145) satisfying at least any of conditions of greatest unoccupied resource (current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4), minimum load (data communication loads, paragraph [0009], page 1, lines 14-17), least hop number (Fig. 4, 720) and shortest communication delay time (access delay due to variable wireless link conditions, paragraph [0055], page 6, line 9).

Regarding Claim 28, Gwon discloses a method (methodology recommended for mobile IP version 6 mobile nodes, paragraph [0048], page 5, lines 2-5) for mobile communications between the mobile node 135 and the corresponding node 140, paragraph [0080], page 9, lines 23-25) comprising:

a step of measuring (Mobile IP version 6 route optimization, paragraph [0055], page 6, lines 2-3) at least any one of a hop number (Fig. 4, 720) and communication delay time (codec, packet formation, propagation and unknown access delays due to high variable wireless link conditions, paragraph [0055], page 6, lines 6-9) to a belonging home agent (Fig. 1, mobile node 145) by a mobile node (Fig. 1, mobile node 135);

a step of requesting (Fig. 5, L3MP mobility prediction, 710) a belonging home agent (Fig. 5, Home Agent (HA) to delete from a memory device registration (Fig. 5, registration 720) of the mobile node (mobility prediction (of deleting) carried out by the facilities of the mobile node 135 to the stored programming, paragraph [0059], page 7, lines 10-12) and requesting a

new home agent to store in another memory registration of the mobile node (local agent 145 for mobile node 135 store newly-established route in its cache for further communications between the mobile node 135 and the corresponding node, paragraph [0080], page 9, lines 19-25), when a result of measurement (value selected to indicate when a hand-off is prior to the actual hand-off, paragraph [0060], page 7, lines 2-7) becomes equal to or greater than a predetermined value (threshold value, paragraph [0060], page 7, line 2);

a step of deleting from the memory device a registration (Fig. 5, registration 720) of the mobile node by the belonging home agent (Fig. 5, Home Agent (HA)); and

a step of registering (Fig. 5, pre-register 720) the mobile node by the new home agent (plurality of agents 145, paragraph [0038], page 4, line 6), the belonging home agent and the new home agent being associated to a same home network of the mobile node,

wherein the new home agent registers a care-of address that the mobile node is utilizing for communication (new “care of” IP address is registered with the home area (HA) by the mobile node 135, paragraph [0050], page 5, lines 10-12), and after the registering step the new home agent forwards messages directed to a home address of the mobile node to the care-of address (packets (messages) transmitted to the home IP address of the mobile node 135 will be tunneled by the home area (HA) to the mobile node 135 at its new “care-of” IP address, paragraph [0050], page 6, lines 20-23).

Gwon fails to disclose a new home agent.

But, Warriar et al. discloses in Fig. 2, home agent control mode performs home agent functions with plurality of home agents 18, 18A and 18B whereby home agent 18 (new home agent) performs tunneling for the mobile node and forwards packets of data from the WAP

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server of home agent, home radius 38 assigned to home network 14 to the foreign agent 16 for transmission to the mobile node 10, columns 5 and 6, lines 58-67 and lines 1-3 respectively.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Warriar et al.'s new home agent because this would have allowed the home agent 18 (new home agent) to forward packets of data to the mobile node 10, columns 5 and 6, lines 66-67 and lines 1-3 respectively.

The combination of Gwon and Warriar et al. fails to disclose the belonging home agent and the new home agent being associated to a same home network of the mobile node.

But, Leung discloses in Fig. 2A, the belonging home agent (HA1) and the new home agent (HA2, HA3) being associated to a same home network (home network 12) of the mobile node (Mobile Nodes 6, 27).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Leung's belonging home agent and the new home agent being associated to a same home network of the mobile node because this would have allowed the original active Home Agent to relinquish its active status and revert to the new Home Agent, column 17, lines 58-60.

Regarding Claim 29, Gwon discloses a method for mobile communications according to claim 28, wherein as the new home agent is selected preferentially a home agent (Fig. 1, home agent 145) satisfying at least any of conditions of greatest unoccupied resource (current Internet addressing and routing protocols and schemes to accommodate network access and data communication by wireless mobile node, paragraph [0018], page 2, lines 2-4), minimum load

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(data communication loads, paragraph [0009], page 1, lines 14-17), least hop number (Fig. 4, 720) and shortest communication delay time (access delay due to variable wireless link conditions, paragraph [0055], page 6, line 9), minimum load (data communication loads, paragraph [0009], page 1, lines 14-17), least hop number (Fig. 4, 720) and shortest communication delay time (access delay due to variable wireless link conditions, paragraph [0055], page 6, line 9).

Regarding Claim 30, Gwon discloses a method for mobile communications according to claim 29, wherein the new home agent is notified from a home agent information managing server (servers of various types, paragraph [0006], page 1, line 8) for managing information about home agents (Fig. 1, home agent 145) to the mobile node (Fig. 1, mobile node 135).

Response to Arguments

2. Applicant's arguments filed December 15, 2009 have been considered as follows:

- In the remarks on pages 11-12 of the amendment, applicant contends that the prior art does not: (1) measure the hop number and the delay time. (2) disclose changing from belonging HA to new HA. (3) disclose changing HAs when the measurement value changes.
- The examiner respectfully contends with clarification that Gwon discloses: (1) that during the time between when the mobile node 135 leaves the home area and establishes a link to the corresponding node, paragraph [0054], page 6, lines 15-20; it has been calculated that the latency (delay) will fall in the range

of about 80-100 msec requiring at most five hops during routing, paragraph [0055], page 6, lines 1-5. (2) mobile node 135 within home agent HA establishes a value that leaves time to enable the mobile node 135 to complete the hand-off to the new agent when the actual hand-off is based on prediction 710, paragraph [0084], page 9, lines 12-18. (3) value selected to indicate when a hand-off is prior to the actual hand-off, paragraph [0060], page 7, lines 2-7; value as to when the actual hand-off based on prediction 710, paragraph [0084], page 9, lines 16-18; mobile node 135 within home agent HA establishes a value that leaves time to enable the mobile node 135 to complete the hand-off to the new agent when the actual hand-off is based on prediction 710, paragraph [0084], page 9, lines 12-18.

Conclusion

3. **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Andrews whose telephone number is (571) 270-1801. The examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rao S. Seema can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LA/la
February 24, 2010

/Donald L Mills/
Primary Examiner, Art Unit 2462

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